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# Disruptive Innovation through Military Design: A Collaboration between the US Joint Special Operations University and the Polish Army

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**ABSTRACT**
This article presents a five-year journey for the Polish Armed Forces and U.S. Special Operations Command's Joint Special Operations University in establishing military design education, theory, and practice within the Polish military. Military design is presented as a significant development in defense theory that draws from complexity theory, systems theory, scenario planning, postmodern theory as well as social paradigm theory as applied to security contexts and war. Military design is a recent development and in part a reaction to traditional, mechanistic, and linear planning and strategy methodologies becoming insufficient in contemporary security environments. The increasing complexity of modern security challenges coupled with institutional barriers to challenging well-established military doctrine, decision-making methodologies, and belief systems concerning war and warfare have ushered "military design" to the forefront of numerous militaries; designing for war is not without controversy and debate over methodological application and relation to existing warfare methods. JSOU and a small team of Polish Army educators would work in tandem to implement military design theory as currently provided within the SOCOM enterprise to international partner nations such as the Polish Armed Forces and Polish Special Forces. The JSOU andragogic approach to design education emphasizes building design facilitation capacity within the partnered organization, and this article explains the five-year process to stand up Polish-centric design concepts and customized education oriented toward Polish security challenges and attuned to cultural as well as geopolitical considerations.

**KEYWORDS**
Military design; innovation; military strategy; design theory; military education

> "Future war will occur on battlefields so numerous and different ways of fighting, and will extend across deep, emergent economic and political issues to confront operational commander … Commanding of a modern army will require more sophisticated and extensive education that previously available"
> - General Stefan Mossor (1986, p. 28)

> "In most allied nation states there is a tendency to recommend, and even require commanders to approach the problems of planning operations with a holistic systems perspective. Involvement in this iterative cognitive process is also suggested and is variously referred to as design … "
> - *Colonel Przemyslaw Pazdziorek, Operational and Tactical Institute, Warsaw (*2016*, p. 30)*

"US Army Special Forces (SF) represent a subculture that prides itself for being rather impervious to doctrinal orthodoxy and very sensitive to the co-opting and protection of

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> noncombatants as an imperative in winning hearts and minds as a core aspect to their work … the SF and other teams, who are considered part of a growing organization, special operation forces (SOF) may indicate the emergence of a counterculture mindset within the DoD."
>
> - Christopher Paparone (2017, p. 12)

The Industrial Revolution ushered in dramatic and expansive change to civilizations, and with it came the violent modernization of war in the "Machine Age" that unlocked previously unattainable war capabilities, capacities, and depth across multiple domains as well as shrinking time and space (Washington, 2002, pp. 27–31). In this modern period of conflict, new decision-making methodologies infused scientific logic with the precise efficiency of twentieth century managerial concepts such as Taylorism (Gray, 1997, p. 118; Waring, S, 1991a; Waring, 1991b), and the industrialization of military form and function became deeply intertwined with the objective orientation of mathematical precision despite war expressing rather chaotic, irrational, and often subjective qualities (Lucas, 2010, pp. 289–291; Paparone, 2017; Sookermany, 2017, pp. 310–311). In the first half of the twentieth century, industrial design quickly became a powerful methodology for civilian and military organizations alike to think, act, and reflect upon complex reality in an expanding multitude of ways. The large-scale total wars of this dramatic period of human civilization seemed well suited for industrialized design of not just the weapons, factories, and armed forces on the battlefields, but also the ways they realized decision-making, knowledge construction, education, and continued professionalization of war (Bousquet, 2008; Gibson, 1986; Paparone, 2017).

The industrialized modern nation-state could prevent, wage, or influence war on a scale and scope previously unreachable and likely unimaginable by earlier societies (Tetreault & Haines, 2004, pp. 2–5). Since the closing of World War II, twentieth-century military organizations remained curiously dependent upon mechanistic organizational and decision-making constructs of the Machine Age (Washington, 2002, pp. 30–31) despite these analytic optimization methods demonstrating strategic failure in post-World War endeavors (Martin, 2015; Paparone, 2017, pp. 516–533). Numerous military academics argue that modern militaries continue to chase their own conceived "golden age" contexts (Builder, 1989; Gray, 1997, p. 172) that reinforce previously successful organizational structures, decision-making models, and even military core belief systems that may now be uncomfortably inappropriate or irrelevant against adversaries that do not take these forms. This creates in modern organizations what Giddens terms *ontological security* where trust in institutional belief systems nests tradition and ritual into routinized social practices (Giddens, 1990, pp. 104–105).

On the current battlefields of uncertainty and asymmetric warfare against emergent and ever-changing rivals that largely reject the "rules" (and even the organizing logics of traditional statecraft and traditional foreign policy), a heterogeneous military design movement has emerged in the last generation of military professionals. The arrival of this new disruptive form for sensemaking in complex warfare contexts appears to have been ushered in by mounting military frustration with irrelevant or outdated constructs and failing strategies in contemporary conflicts. There has been a growing institutional inability to recognize novel opportunities in dynamic, complex contexts that coincides with the emergence of military design praxis. (Beaulieu-Brossard & Dufort, 2016; Graicer, 2017c, 2017c; Jackson, 2019b; Zweibelson, 2015b).

The Polish Army, well aware of the rapidly changing and dynamic threats of the twenty-first century, is currently transforming from a traditional or “modernist” military mindset to one that is more flexible, innovative, and critical through applying a military design mind-set. As a medium-sized nation positioned within traditional as well as emergent threats in the European theater and the global commons, Poland is in the company of Sweden, Norway, and other European nations suddenly concerned with complex strategic challenges that, even a decade ago, seemed distant or irrelevant to competing security demands (De Spiegeleire, Sweijs, Wijninga, & van Esch, 2014; Porkolab & Zweibelson, 2018; Sookermany, 2017; van der Veer, 2018; Zweibelson, Hedstrom, Lindstrom, & Pettersson, 2017). Despite Poland’s investment in this novel and controversial approach to military thought and action, formal military design education and practice across NATO and the European continent as of this writing remains premature and contested with many military traditionalists highly skeptical of using anything other than established military doctrine and heavily industrialized, mechanical decision-making models for war. Poland is one of only a few experimenting at the scope and scale for military professional education in design.

Over the past 5 years, a small group of Polish military professionals, academics, strategists, and educators have partnered with military designers from the U.S. Special Operations Command (USSOCOM) at the Joint Special Operations University (JSOU) on military design education, theory, and practice. Together, they have developed and implemented some disruptive design methodology that capitalizes on innovation, divergent thinking, critical reflection, and experimentation. They have taken these methodologies into the professional military education system for Polish Army Officers as well as smaller populations of associated Eastern European military professionals. Starting small scale in 2015, this program has quickly grown into a formal military design module of education, theory, and practice at the Operational Art and Tactics Institute, located at the War Studies University, Warsaw as well as across Eastern Europe through the Baltics and onward.

The next generation of Polish leaders in security and defense must become more comfortable with uncertainty as well as more willing to experiment creatively and disruptively than even the heroic Polish warriors of earlier conflicts so as to bring about novel military transformation. Military design is now intended to be a cognitive vehicle for revolutionary change and critical reflection. The Polish War Studies University established new design education standards with their military officer education focusing on implementing design theory and practice for their field grade, and senior leaders. To achieve this, they are using JSOU’s design expertise, unique 'meta-design' philosophical approach toward design education, and the exceptional faculty development programs.

Also over the last five years, hundreds of Polish officers (as well as associated partner nation student graduates of the Polish War Studies University year-long program) have conducted multiple weeks of military design education culminating in a week-long intense military exercise at Warsaw. Many of these students encountered military design for the first time and, as the movement spreads across services, countries, and dynamically into a multitude of military contexts, the broader military community of practice is beginning to take notice.

## POLISH ARMY INNOVATION: DESTRUCTIVE CREATIVITY AND WARSAW EXPERIMENTATION

The military design community of practice features a wide range of stakeholders and actors drawing from multiple design disciplines (Beaulieu-Brossard & Dufort, 2017b, pp. 273–289; Graicer, 2017c; Jackson, 2019c; Martin, 2015; Naveh, 2010; Paparone, 2019; Sookermany, 2013). Within this minority group, design theorists and practitioners struggle with how to bridge the potential gap between "doing the wrong thing right" where tactical successes do not lead to any strategic progress, and creating innovation and transformation through experimenting "doing the right things wrong" and learning reflectively in complex, dynamic conflict situations (Ackoff, 2004, p. 2). Many military designers draw from combinations of complexity theory, postmodern architecture, and non-western perspectives on war to establish their military design methodology (Feldman, 2007; Graicer, 2017a, 2017b; Munari, 1966; Naveh, 2005a, 2010; Tschumi, 1997).

Military designers are experimenting with sociology, organizational theory, and multiple paradigms for framing the intersection of society and organized violence beyond scientific parameters (Jackson, 2019c; Paparone, 2013, 2019; Zweibelson, 2016a, 2016b). Other designers modify existing human-centered design methods and attempt to blend civilian design concepts with security-based applications (Canadian Forces College, 2017; Gilbert, 2019; Gilbert & Zweibelson, 2019; Jackson, 2019a; JSOU User, 2019; Keegan, n.d.; Mitchell, 2017; Nelson, 2017).[1] A few tailor their military design to just a small elite group of high-level leaders and thinkers (Feldman, 2007; Graicer, 2017b) while others endeavor to simplify a military design method in order to implement it across an entire military force for maximum comprehension and application, often at a potential cost of diluting design into traditional planning constructs therein (Banach, 2009; Graves & Stanley, 2013; Grigsby et al., 2011; Ryan, 2016).

Some military designers openly demand uniformity and decry "there is only one way to do design … our way" which is usually detected with pronouns such as "*The* … way to design" or otherwise attempt to steer a service or COCOM to a single overarching design methodology, while others promote plurality, and mixed methods in a military design approach (Beaulieu-Brossard & Dufort, 2017a; Jackson, 2019b, 2019c; Martin, 2015; Zweibelson, 2018b, 2019a). Many military services are restricted to adhering to their own service doctrinal interpretation of what "design" means, while other military organizations have no formal design and are more able to draw from a variety of design methods. Some militaries draw from civilian design methods directly, while others either modify them for security contexts or seek out specific military design constructs exclusively. All of these design endeavors attempt to generate novelty and innovation within security contexts through critical, creative, and experimental actions.[2] In this complex and dynamic fog of military design experimentation, select Polish military educators and academics sought to spark design thinking from within the Polish profession of Armed Forces in 2016.

Przemyslaw Pazdziorek, serving as a Colonel in the Polish Army, took a director position at the Polish Army's Institute for Operations and Tactics in Warsaw and began conducting research into systems theory, organizational change, and military design. In 2016, Pazdziorek published a book on military design research in Polish (Pazdziorek, 2016) and contacted JSOU for assistance after learning of the JSOU design curriculum.

Pazdziorek sought to export military design from the United States into Poland via an established military partnership between the United States Special Operations Command (USSOCOM), through JSOU's international educational outreach and the Polish Armed Forces. JSOU had a small cadre of military design theorists, practitioners, and educators working on design topics. This small group was to engage in a series of mobile education sessions that sought a Polish-customized form of military design, rather than any pre-existing military design "cookie-cutter" styled approach.[iii] Polish design development needed to be internalized, considered from within Polish cultural and organizational contexts, and set within the unique geopolitical challenges Poland as a middle-power nation in Eastern Europe was experiencing today. The Warsaw program also required further attention to the deep military history of Poland's Army, as the institutional reach would have some enablers as well as significant barriers to the disruptive qualities of military design theory and education.

As the Polish Army began considering military design education for their mid-career and senior military officers, they were part of a heterogeneous and decentralized military design movement across much of Europe. Similar design experimentation is occurring in the Royal Netherlands' Army (van der Veer, 2015, 2018), European strategic think tanks (De Spiegeleire et al., 2014, Zweibelson et al., in press), Sweden's War College (Zweibelson et al., 2017), Norway's War College (Sookermany, 2013, 2017) as well as in various pockets of professional interest in NATO and other European militaries (Beaulieu-Brossard, 2020; Beaulieu-Brossard & Dufort, 2017a, 2020; Porkolab & Zweibelson, 2018). European industry, academia, and the military profession are also becoming increasingly aware and intrigued by the military design movement, and as the small movement gained momentum in Warsaw as well as elsewhere, military design topics appeared in conferences, journals, workshops, doctrine as well as white papers and defense exercises (Beaulieu-Brossard & Dufort, 2020; JSOU User et al., 2018; Zweibelson, 2019b, 2019c, 2019d, 2019e; Zweibelson, Whale, & Mitchell, 2019). With this explosion interest across Europe, a brief summary of the larger military design movement up to Polish incorporation is warranted.

## A BRIEF SUMMARY OF THE INTERNATIONAL MILITARY DESIGN MOVEMENT

The term "design" is problematic in military as well as in broader civilian commercial design communities. Military strategists and detailed planners often frame "design" as strategic or abstract activities to arrange and set necessary conditions for subsequent sequential planning of military operations. These are usually organized in time and space where a reductionist approach to breaking down military activities in relationship to physical location and temporal position is understood through analytic optimization and convergent language. Traditional military planning executes this by establishing detailed phases of a campaign set in one or more theaters to accomplish national or coalition strategic goals (Kelly & Brennan, 2009, p. 8; Kem, 2009a; Zweibelson, 2015b).

Yet in civilian disciplines, "design" occurs through industrialized contexts where new products or user experiences are sought through a combination of convergent and divergent activities. Industrial design arrived in its modern form through the mass-production and technological advancements of the Industrial Revolution over the last two centuries in particular. This would be followed with subsequent inspiration to shift industrialized design toward empathetic and increasingly sophisticated artistic or multiple stakeholder constructs by the 1950s-1960s (Droste, 2019; Gossel, 2019; Papanek, 1971; Tschumi, 1997). This produced managerial developments and organizational structures in commercial and military forms that capitalized on causal logic, analytic optimization, and increased efficiencies through convergent functional processes (Archer, 1968; Davis & Gristwood, 2016, pp. 4–6; Simon, 1996). Yet in this period, designers also gained an increased awareness of a growing tension between design efficiency and that of design *situatedness* and creative innovation.

Human-centered design would develop beginning in the 1960s after a purported lack of subjectivity and critiques against the supremacy of "objectivity coupled to efficiency" of industrial design. This transition encouraged designers to consider empathy, paradox, irrationality, and complexity in more comprehensive, inclusive, and often paradoxical ways than earlier design methods (Buchanan, 1992; Papanek, 1971; Rith & Dubberly, 2007a; Rittel & Webber, 1973). Human-centered design methods opened up new approaches for complexity, innovation, and creativity within competitive socio-economic systems beyond the more sequenced, analytic-oriented, and efficiency-based industrial design methods (Dorst, 2015; Nelson & Stolterman, 2014; Protzen & Harris, 2010, pp. 155–169; Simonsen et al., 2014). Industrial design concepts, throughout the twentieth century, would greatly influence modern military decision-making methods and management systems encompassing nearly all current military doctrine, education, and centralized hierarchical organizational structuring (Jackson, 2020, 2019c; Paparone, 2013, 2017; Zweibelson, 2014). Yet human-centered design methods would only influence some of the late twentieth-century military thought and doctrine through stakeholder mapping and "red-teaming" while, in other ancillary concepts in military decision-making, the industrial designed linear and mechanistic analytical model for organizational form and function remained unaltered (Paparone, 2013, pp. 71–98).

Militaries after the Cold War entered an unanticipated period of intense peacekeeping and humanitarian demands. These were coupled with exceptional technological and educational developments as well as growing public demands for streamlined, downsized, and highly accountable military forces that were increasingly accessible in real-time through formal and informal media coverage. Subsequently, the term "design" had myriad meanings depending on which discipline or field was debating its usage for defense applications. Industrial designers and their traditional "Taylorism management" inspired counterparts continued to view war as a complicated problem of information gathering, analytic optimization, and deductive logic. This was coupled with enduring principles of war based on Newtonian metaphors through which design existed at an abstraction just above the formation of campaign plans (Lucas, 2010, p. 289; Paparone & Crupi, 2005). Meanwhile, human-centered designers across industry, public works disciplines, and increasingly complex intersections of technology and society moved away from the cumulative-sequenced logics of industrial design toward iterations of sense-making, empathy, and deeply critical considerations that included paradox and multiple perspectives (Buchanan, 1992; Gioia & Pitre, 1990; Papanek, 1971; Rith & Dubberly, 2007b).

Since the fall of the Berlin Wall and through the 'Post-9–11' period of increased anti-terrorism and counter-insurgency activities, militaries across the industrialized West tend to position "design" as an optional precursor to linear and mechanistic planning methods, particularly as something done in *mission analysis* and cast within linear, mechanistic military planning methods (Banach, 2009; Bullock, 2009; Dalton, 2006; Grigsby et al., 2011; Kem, 2009b). This reasoning suggests that one has no need to "design" if a military challenge looks quite like previous things they successfully tackled and needs only to update the existing plan. In doctrine as well as military education, most of the industrialized design concepts first wedded to traditional military form and function remain largely unchanged over the last century; still rooted in Newtonian physics metaphors, Taylorism-inspired management theory, and classical Prussian-inspired Staff 'division of labor' constructs for decision-making and specialized staff focus (Paparone, 2013, pp. 10–16; 2017; Waring, S, 1991a, pp. 9–19). Today, in various military communities, strategists and military theorists disagree strongly on nearly all aspects of military design and even whether "design" is necessary or value-added to military organizations confronting complexity (Beaulieu-Brossard, 2015; Dalton, 2006; Graicer, 2017c; Grome, Crandall, & Rasmussen, 2012; Vego, 2009). In this dynamic context, several military organizations, including the Polish Army, have surged ahead of many of the industrialized western nations to promote some unorthodox and controversial decision-making methodologies that make sense of societies and war in unprecedented ways.

## FACILITATING FACILITATORS FOR POLISH ARMY EDUCATION AND PRACTICE

Paździorek's vision for the Polish Operations and Tactics Institute was a radical shift away from traditional military education and theory in the wake of the dramatic security challenges as well as changes in Eastern Europe and internationally since the new millennium. Although the linear NATO "operational planning process" and familiar strategic concepts would remain in Polish senior officer education at Warsaw, Paździorek incorporated design theory well beyond any contemporary programs at NATO Schools or other similar European War Colleges at the time.[iv] At the time of this writing, the Polish military design program in Warsaw is the most established and largest professional military education (PME) module for design education in Europe.[v]

Using military design as a postmodern mode for organizational transformation and emergent strategy-making, Paździorek sought to do more than periodically import existing military design training that would make Poland's internal military education structure dependent upon outside expertise. Furthermore, the Polish program sought customizable design methodology that did not reproduce an existing design process right out of American doctrine (or other contemporary design model such as Israeli "systemic operational design") such as other contemporary military design efforts.[vi] The Polish wanted a military design appropriate for Polish strategic contexts which were empathetic toward Polish culture and military history.

Paździorek identified and selected a small group of military educators within his Polish faculty that demonstrated the potential to learn sophisticated and rather unorthodox design concepts that could be translated and further modified into a Polish Army approach including systemic thinking and organizational change. Already familiar with a range of military design methods available from different schools of thought on how to "do design" in military applications, Paździorek began coordination with U.S. Special Operations Command through SOCOM's educational arm, JSOU in 2015 after researching the multidisciplinary military design work of Ben Zweibelson, the JSOU design program director (contractor) and a widely published design theorist. JSOU already had a strong educational partnership with the Polish Army and their Special Forces, and this expansion into military design education was nested within the JSOU overarching charter for Special Operations and international partner education and development.

Between 2016 and 2019, several Polish military instructors began a long-term exchange with the JSOU design program in Tampa, Florida where design educators would bring Polish instructors into basic and advanced design courses and Warsaw would host design education for Polish Army students with both American and Polish design instructors facilitating.[vii] Over several years of intense design education, facilitation, and instructor immersion, the Polish design instructors began modifying and implementing their own design education in the Polish formal military developmental programs that field grade officers attended for their year of mid-level professional education. Initially, a five-day basic program was taught in Polish and English in 2016. Subsequent versions of the design education would expand and deepen the content resulting in a ten-day academic design program by 2017 that introduced students to basic design theory, language, concepts, and practical exercises in design teams addressing a challenging and complex military scenario set within contemporary Polish security challenges. These courses featured a mix of Polish and English instruction in lecture halls and classroom settings, coupled with extensive hands-on design projects for small teams of students.

Polish military design education progressed through 2018 where Paździorek continued the relationship of design faculty exchange between JSOU and Institute of Operational Art and Tactics in Warsaw while also moving to expand the Warsaw design program into an Eastern European “Center of Design Excellence.” By concentrating on a small yet deeply experienced group of Polish design facilitators in Warsaw, Paździorek next sought to develop a network of military design facilitators, educators, and theorists across the Baltic states, Eastern European partner nations, and throughout NATO and European security enterprises. Part of this included Poland participating in international military design conferences such as the 2019 IMDC (Innovation Methodologies Defense Challenges) hosted by the University of Lancaster in the United Kingdom, as well as the previous IMDC held in Ottawa, Canada in 2018.[viii] As of December 2019, the program continues with annual eight to ten-day design modules complete with an intense regional scenario oriented toward Russian emergent security concerns. For the 2020 academic year despite COVID-19 challenges, the Polish design education will expand to encompass all company-grade Polish officers at the intermediate-level education, all field grades, plus all Polish war college-level officers where “leading design” will be added to existing PME curriculum through JSOU assistance.

## TAILORED DESIGN: A POLISH MIND-SET FOR POLISH SECURITY CONCERNS

While there are numerous examples of a military organization simply taking an existing design methodology out of practice or another armed forces’ doctrine and assimilating it, Paździorek and the JSOU design faculty preferred to use an adaptive multidisciplinary military design methodology previously applied experimentally at the Canadian Forces College (CFC), the United States Air War College, and through the JSOU design program in various forms (*Canadian Forces College 2018–19 National Security Programme DS/CF 592- Modern Comprehensive Operations and the Complexity of Contemporary Conflicts*, 2018; Mitchell, 2017; Zweibelson, 2017, 2018a, 2018b, 2019b). This 'meta-design' approach was first developed by Zweibelson at JSOU and would inspire the program at the CFC, U. S. Air Force design initiatives, as well as subsequent implementation across SOCOM, U.S. Space Command and in other international setttings. Since the Polish adaptation of design methods used at JSOU, the Swedish War College and the NATO School have both followed suit in 2019 and implemented similar courses with JSOU support (Porkolab & Zweibelson, 2018; Zweibelson et al., 2017).

The ten-day Polish design course would feature a flexible design (meta) methodology that emphasized Sociologist Donald Schon's "reflective practitioner" concept as well as strong influences from social paradigm theory, complexity theory, organizational theory, and scenario planning methods (Beaulieu-Brossard & Dufort, 2016; G. Martin, personal communication, October 15; 2017; Paparone, 2019; Schön & Rein, 1994; Zweibelson, 2012a, 2012b, 2016a, 2016b; Zweibelson et al., 2019). Numerous concepts used in this methodology trace back to the deep and challenging military design concepts originally developed by Brigadier General (retired) Dr. Shimon Naveh in the Israeli Defense Forces in the last three decades (Beaulieu-Brossard, 2020; Graicer, 2017c; Hirsch, 2016; Israeli Defense Force Doctrine and Training Division, 2015; Naveh, 2005a, 2010). Design students would be challenged to "find their frame" and define their preferred military paradigm that their organization tended to apply as well as the limits of those frames and how a complex reality frequently had many alternative ways to interpret the same reality from another paradigm (Burrell & Morgan, 1979; Gioia & Pitre, 1990; Jackson, 2018, 2019c; Lewis & Grimes, 1999; Lewis & Kelemen, 2002; Zweibelson, 2016a). Designers would explore the tensions between these views and consider design opportunities, challenges, and interplay (Schultz & Hatch, 1996; Zweibelson, 2019a) as well as a range of possible futures in which design activities could open up novel developments and highly nonlinear paths to different emergent contexts.

To do this, the students would need to "drop their tools" (*The JSOU JAWS Exercise and How SOCOM Is Dropping Cognitive Tools with Military Design – YouTube*, 2020; Weick, 1996) and avoid the military traditional "reverse-engineering" methodology of reverse planning, ends-ways-means, and mechanistic planning constructs strongly featured in most operational planning processes (Zweibelson, 2015b). This new design methodology, in practice, moves the military decision-making orientation away from a rational, scientific-analytic, and calculated structural adaptation to environmental change in security contexts (Booth, Kestnbaum, & Segal, 2001, p. 320). The volatile, unpredictable, and uncertain conditions of twenty-first-century conflicts are gradually, and at times at high expense, transitioning militaries away from the centralized hierarchical organizational form which all modern military decision-making methodologies such as NATO's operational planning process and the U.S. Joint Planning Process rigidly enforce (Anderson, 2012; Jackson, 2018; Kelly & Brennan, 2009; Porkolab & Zweibelson, 2018; Zweibelson, 2015b). Military design in most of its varying forms disrupt this hierarchy by increasing horizontal communication, enhancing multiple often paradoxical perspectives, and acknowledging different paradigms while highlighting the inability for military "science" to encompass all essential parameters for military thought and action (Gibson, 1986, p. 23; Malešević, 2010, p. 28; Mintzberg, 1990, p. 944; Paparone, 2013, pp. 36–41).

As Polish students framed their own contextually unique worldviews, military design facilitators helped them consider alternatives and the systemic relationship comprising them within a complex, emergent reality. Design students in small, diverse teams would design and experiment across a conceived range of possible futures with additional emphasis on challenging traditions and organizationally sanctioned outlooks that develop due to internal biases and institutional tendencies to converge instead of diverging in creative thinking. Echoing complexity theorist Russell Ackoff's maxim, designers sought to "do the right things wrong" instead of pursuing "doing the wrong things right" which could only lead to being more wrong but institutionally comfortable at obfuscating repetitive strategic failure as some other form of success (Ackoff, 2004, p. 2). Ackoff critiqued late-twentieth century commercial corporations of conducting "rain dances" that had no impact on the actual 'weather', despite the organization imagining the dancing did something useful by planning. "Moreover," he wrote, "it seems to me that much of the advice and instruction related to corporate planning is directed at improving the dancing, not the weather" (Ackoff, 1981, p. ix). Thus, organizations including military ones will ritually act out set decision-making methods and doctrinal procedures over and over, without ever critically examining or challenging why they do these activities or if others might be of greater value beyond the boundaries of one's institutional belief system.

To mitigate this within their own military, the Poles would implement design theory. Initially, the Polish designers would construct a 'normative' future, also described as the one that a military organization implicitly sought out regardless of the particular security context presented. This is frequently done in order to maintain institutional relevance, prediction, and non-critical validation of existing planning practices; the phrase "organizations armed only with hammers turn everything into a nail" applies here. Once this optimized future was cast (if only to get the students to drop their favorite tools), design teams were coached to expand radically from this point of departure and develop alternative futures in which various system tensions would manifest in different as well as emergent and transformative combinations. Designers would need to think abductively instead of purely in deductive or inductive forms (Moore, 2017, p. 5–7). This proved challenging for the students as the process violates most tenets of modern military decision-making that capitalizes on "ends-ways-means" logical structures, analytic optimization, and implicitly categorizing complex reality as controllable through engineering concepts and combinations of inductive and deductive logic (Monk, 2017; Paparone, 2017, 2019; Paparone & Crupi, 2005; Zweibelson, 2015a, 2015b, 2016b).

This style of scenario planning folded into the military design methodology draws from business practices and complexity theory first developed in the 1970s. Despite decades of usage outside the military, scenario planning remains largely absent from most military doctrine and professional military education even in 2019 (Sikander, 2016; Tunnicliffe, in press; Wack, 1985; Wilkinson & Kupers, 2013). If present, the scenario planning frequently reinforces codified branch plans and sequels that again espouse an indoctrinated single-frame decision-making methodology by creating two or more futures that simply validate the organization's established assumptions and beliefs. Military historians such as Builder observed military services doing this perpetually; always projecting institutional beliefs about the past upon all future military tasks in ways that benefited that branch of military service even over national interests (Builder, 1989). Sociologist Karl Weick further explains: "Bureaucracies see what they have seen before and they link these memories in a sequential train of associations … [They] tend to imagine the past and remember the future" (Weick, 2006, p. 448). Instead, the Polish designers reflected on why they frame future states as they do and how they can challenge and disrupt that thinking through exploring radical alternatives that present novel contexts for unexpected advantages and opportunities.

Polish military designers would use a range of possible futures wherein the system did not present actual "solutions" or the elimination of major systemic tensions. Just as a military cannot attempt to completely eliminate corruption or perhaps defeat a decentralized non-state actor insurgency movement through purely physical (tactical) activities, designers must consider systemic tensions as abstract assemblages well beyond their ability to control, predict, target, or analytically reduce into more manageable subcomponents (Ackoff, 1971, pp. 661–671; Boisot & McKelvey, 2010; Tsoukas & Hatch, 2001; Zweibelson, 2013, pp. 87–104). This is where the postmodern aspects of military design introduce concepts such as deconstruction, alternative knowledge forms for interpreting reality, and an emphasis on sensemaking by considering metaphor, social construction, and dynamic meaning (Boisot & McKelvey, 2010; Graicer, 2017a, 2017b; Maitlis & Sonenshein, 2010; Naveh, 2005b, 2010; Naveh, Schneider, & Challans, 2009; Weick, 1993; Zweibelson, 2013).

The military design methodology employed by the Poles would be expressed as iterative and nonlinear in that a design team can commence and complete a design inquiry without being constrained into performing the same sequences or following the same path. Instead, after multiple iterations of framing and reframing their understanding of a complex system, the Polish designers would experiment with many design concepts across the range of potential futures for their system expressing different ways of designing through the creation of design metaphors that bring together previously unpaired concepts. This emphasis on divergent thinking, creativity, and critical self-reflection requires strikingly different educational approaches than what is normally experienced in professional military education (Mitchell, 2017; Paparone & Squier, 2019; Ryan, 2016; Sookermany, 2017; Zweibelson, 2019f).

During multiple-facilitated sessions of military design practice, Polish students were coaxed into a playful, experimental, and rather "un-military" context of learning through reflective practice instead of more rigid "see, imitate, repeat" passive education practices. Students were discouraged from doing any of the traditional and dominant practices in modern military professional education such as creating dense PowerPoint presentations, highly detailed rehearsals, and convergent activities oriented toward increasing uniformity and repetition. Students instead were constantly challenged to "wipe the boards" of their work even toward the end of the design sessions when social pressure is highest toward solution-oriented mind-sets and "cooperate to graduate" thinking. Polish design teams would mix drawings with templates, sculptures, game devices (gamification in design with puzzles, cards, toy artifacts, and other stimuli), as well as even act out skits or role-play with their design strategic sponsor during design discussions on the security challenge.

This military design methodology's orientation toward the reflective practice of a learning mind-set forced them toward a divergent and experimental context where concepts were fleeting, temporary, and expected to trigger nonlinear exploration toward unexpected and novel territories of thought (Gero & Kannengiesser, undated; Schön, 1995; Schön & Rein, 1994; Weick, 2011; Yanow, 2009). Throughout the design education, students were coached to become mindful of their own thinking and acting at a meta-design level; to "think about your thinking" and reflect extensively upon why they do these processes and use the language that they do to frame and act in a military context (Chia, 1999; Hatch & Yanow, 2008; Lewis & Grimes, 1999; Paparone, 2008; Schön, 1993; Tsoukas, 1991, 2009). Daily, the students added to a design group "journey map" that illustrated their reflective practice over the entire design education period. The journey map frequently became the first design artifact viewed by other design team members, with many finding irony, humor, or shared misery in how the team was expressing their frustrations as well as victories in learning and applying military design in the course.

The students in Warsaw were broken down into design teams of eight to ten military officers with a majority being members of the Polish Armed Forces separated so that as many different service backgrounds and experiences were mixed across the design teams as possible. Although ideally a military design team works best at slightly lower team numbers, the larger class of 55–65 Polish students and the limitation of qualified faculty members required slightly larger design teams. Services were equally divided across the teams, with representatives from across Poland's services and specialized organizations. Each team participated in the design group lectures and subsequently conducted design activities in their own design space complete with numerous whiteboards and tables covered in toys and design tools. These design teams worked together throughout the design course but also cross-pollinated with other design teams during various exercises and during periodic sharing of team progress on the design scenario topic. Each designer was continuously challenged to frame their own individual paradigms as well as that of the larger group using the different sociological and philosophical concepts provided in the design course. Teams would draw inspiration or offer sharp critiques to their peers while exploring any of the eight other design teams operating on the same complex challenge for Polish security concerns.

This emphasis upon reflective practice required the design facilitators to frequently take away student "tools" and channel their design activities toward uncomfortable or unfamiliar modes of thought and action. Facilitators nudged this process by including deliberate "tool dropping" activities throughout the design program (*The JSOU JAWS Exercise and How SOCOM Is Dropping Cognitive Tools with Military Design – YouTube*, 2020; Weick, 1996). Students were given LEGOs$^{tm}$, sticky notes, and colorful modeling clay to work with instead of PowerPoint and rehearsed planning scripts. Students played with balls and other toy-like artifacts and were praised when they deconstructed traditional or institutionally sanctioned concepts, doctrine, language, and behaviors through informal, novel, and temporary design experiments. Ideas would be rapidly sketched out and shared within a team only to have many erased so that new ideas triggered by this last generation of thought could be ushered forward. This 'wiping the boards' construct would be iteratively applied throughout the design course. Once the students became comfortable with the design activities, they began to challenge traditional boundaries of thought and action. However, this was not particularly easy for some students who could not let go of many deeply cherished beliefs in established doctrine, military theory, and practice.

Designers were challenged to cycle iteratively instead of gradually building upon a steady pre-determined progress or checklist of activities. In a military planning context, students later in the course would expect to be further into an advanced war-game activity and be closer to publishing a detailed operational plan while these design students, even on the last day of the exercise, might be returning to perform yet another iteration of initial design framing. This design mindset required a shift from goal-orientation toward one of emphasizing learning through divergent thinking and experimentation (Davis & Gristwood, 2016, p. 12; Stanley & Lehman, 2015). This inclusion of “play” (Capps, 2012; Hjorth, Strati, Dodd, & Weik, 2018; Zweibelson, 2019f) and the emphasis on iterative and nonlinear design practice was paramount in the Polish design educational experience and is based on extensive military design experimentation at Joint Special Operations University as well as at a few other organizations where military design has taken hold. In several of the academic years, other outside military design experts would be invited to lecture to the students, with representation from Canada, Denmark, Norway, and other nations; the international impact of the military design community of practice resonated with the Polish students.

## CONCLUSION: DISRUPTIVE THINKING TAKING HOLD IN EASTERN EUROPE TODAY

Twenty-first-century security challenges are different than previous ones and demand a military organization that is dynamic, flexible, willing to experiment, and able to think and act in ways previously unexplored or considered (Booth et al., 2001; Gray, 1997; Khan, 2004, p. 274; McFate, 2019; Sookermany, 2017). Although current security challenges continue to possess nearly all of the previously encountered military topics of concern such as conventional war, weapons of mass destruction, and competitive adversarial activities short of declared hostilities, the advancement of society and technology has introduced entirely novel security challenges. While everything that was a challenge previously remains valid, entirely wicked and unencountered challenges are piled atop that are all scrambled in an increasingly fragmented and advanced technologically dependent world of change and uncertainty (Snider, 2000, pp. 49–53; Washington, 2002, pp. 27–30; Zalman, 2006, pp. 35–37).

The rise of the “Information Age” and what some offer as the “Postmodern” or “Post-Industrial World” produces unfamiliar and disruptive challenges that modern military organizations are increasingly unable to make sense of or influence in a productive or controlling manner (Booth et al., 2001; Chia, 2003, pp. 113–140; Sookermany, 2013, 2017). Cyberspace, the spread and speed of social media, globalization, machine learning, genetic manipulation, and the growth of robotics are just a few of the radical technological developments. On the social complexity side of security affairs, militaries today are increasingly alienated from the public, have a growing gap between non-veteran political leadership, and subject to increasing public demands for social transformation away from traditional military cultural norms and beliefs (Snider, 2000, pp. 48–53). Armed forces are increasingly bound by more rules and ever-increasing bureaucracies (Malešević, 2017, pp. 456–474), while enemies appear less tethered to any of the expectations afforded traditional militaries which could aid in some semblance of prediction, control, and risk-reduction in their application of violence (Gorka, 2016, pp. 353–355). Militaries today are expected to think and act in a rapid information-rich environment against adversaries unwilling to adhere to any notion of military rules, traditions, or historic patterns as the adherence to these “traditions” is seen as a distinct disadvantage (Gorka, 2016, pp. 353–364; Levitt, 2016, pp. 169–173; Lockhart & Miklaucic, 2016, pp. 297–305).

In this swirling brew of complexity and social instability, the growing ability of non-state actors to gain temporary parity or wield “instruments of power” previously attainable only by advanced nation-states is of increasing concern for militaries intent on protecting their national security. Most prominently in cyberspace (but also in traditional physical domains for warfare as well), modern militaries appear to be quickly outpaced by innovative security rivals in terms of narrative, influence, and potentially the partial control of highly complex, dynamic contexts that represent security interests. Poland, in more ways than mere geographic location, is deeply immersed within these security trends and emergent patterns and the traditional military methodology for strategic and operational thought and action continues to demonstrate limitations and liabilities.

Poland faces several difficult challenges. As a middle-power nation emerging once more to participate with the industrialized West in the aftermath of the Cold War, Polish defense spending is limited while, geopolitically, Russian overt and covert activities still threaten to disrupt it militarily as well as in other ways. Polish military organizational form remains wedded to the traditional centralized military hierarchy that resists investing in emergent and rather radical, even unorthodox (postmodern) military design concepts. These design concepts challenge modern mechanistic military decision-making methods as well as established doctrine, while technological developments in information access, speed, and public opinion make military strategic transformation sluggish and disjointed. Concurrently young and creative people in Poland continue to view military service as a detriment or, at best, a less attractive opportunity. Lastly, although the culture of Special Operations Forces in the United States is typically comfortable with innovation and unorthodox military concepts and these align with the history and military culture of the Polish resistance forces, the Polish Army will struggle to broadly implement military design while the U.S. Department of Defense and NATO are also not yet entirely embracing the movement. Despite these challenges, the design education available at the Institute of Operational Art and Tactics in Warsaw will provide graduating students with the ability to exploit opportunity and disruptive innovation to bring about a postmodern military transformation.

The rise of the Polish military designer is that of a reflective security practitioner (Gero and Kannengiesser, in press), able to apply disruptive and experimental frames for cognition in a dynamic and complex security context. In Warsaw, Polish design educators are influencing and shaping the next generation of Polish Army Officers as well as security partners across Europe through their new and developmental approach to design. By partnering with American design educators at Joint Special Operations University and implementing advanced military design theory and practice, these international military educators are continuing the necessary development of future military leaders. While the disruptive and experimental nature of military design poses some threat to institutionally cherished concepts and methods that may have outlived their value, the speed and diversity of change in this postmodern world requires tomorrow's military leaders to let go of today's favored tangible and intangible tools for defense in order to quickly seize and employ novel ones unlike anything seen before.

## Notes

i. The authors present their own opinions in this article and their views do not indicate any official position of the United States Department of Defense, U.S. Special Operations Command, the University of Lancaster, or of the Polish Armed Forces.

ii. Some military design methods, particularly those associated with service doctrine will restrict the design practice to adhering to preexisting military planning terminology, principles, and set operational art constructs not used for design initially. Other design methodologies draw from entirely dissimilar language, logic, and constructs that challenge or contradict traditional military planning doctrine.

iii. The authors of this article were part of the design faculty exchanges between USSOCOM's Joint Special Operations University and the Polish Army's Institute for Operations and Tactics.

iv. Since 2016 and the first Polish design education occurring in Warsaw, several other European military programs have taken notice or independently sought out design concepts. Within three years, programs such as NATO Schools, the Royal Danish War College, Swedish and Norwegian Defense Universities and multiple smaller units and organizations across Europe have begun some form of design experimentation or formal education into their military schooling. Several of the authors are directly involved in these efforts through JSOU or other associated academic contact.

v. The Warsaw military design program reaches 55–65 students annually since 2016 while committing 5–8 days and 40–64 contact hours exclusively on military design education using 4–6 design cadre. Excluding outside organizations such as JSOU that provide mobile design education to various partner nations, the Polish design program is the largest established European located military design program in operation as of 2019. As of October 2019, the NATO Schools organization in Oberammergau had executed two classes of a pilot program using JSOU's design methodology in military design education for NATO students, however the Polish program student numbers greatly exceeded the anticipated NATO pilot program numbers for 2019. The Swedish War College in Stockholm also executed their first military design pilot course in conjunction with JSOU in October 2019.

vi. Various contemporary military design methodologies have mimicked or reproduced established methodologies or repurposed a commercial design model for military application. These copycat versions tend to use the same graphics, language, and structure as the original design concepts with often superficial word changes.

vii. JSOU offers a basic design course titled "SOC 3440: Special Operations Forces (SOF) Design and Innovation Basic Course", an advanced version titled "SOC 4445: SOF Design and Innovation Advanced Course", as well as a customized scenario and classifiable version titled "SOC 2440: SOF Design and Innovation Tailored Scenario Course" that applies design to real-world SOCOM challenges. All of these courses are available through the JSOU registration portal or through coordination with JSOU faculty and administration.

viii. All of the authors participated in the 2019 IMDC with Polish design educators contributing to an international military design panel as well as various networking and educational collaborations at the conference. See also: https://www.lancaster.ac.uk/security-lancaster/imdc2019/

## DISCLOSURE STATEMENT

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